



# Mini-MRF Lesson

**Grade Level:** K-12

**Time:** 50-80 minutes

**Subject areas:** Reading, Science, Social Studies, Economics, Health

The Mini-MRF kit, including the book *Agatha's Feather Bed* and the natural resource lesson is a fun way to introduce all ages to natural resource and recycling themes. What is a MRF? In simple terms it is a mechanized recycling center or **Material Recovery Facility-MRF**. The Mini-MRF provides learners with a field trip experience in the classroom. The Mini-MRF is flexible and is effective from classroom to conservation day. The Iowa Recycling Association hopes you find these tools helpful.

## What you will need:

- **Local recycling information and samples of materials:** (steel and aluminum cans, clear, brown, green glass, #1-#7 plastic bottles (or all plastics if accepted), Newspaper, magazines, white paper, junk mail, chipboard (cereal-boxboard), and corrugated cardboard.
- **Mini-MRF Kit:** (kits are available to borrow at: [iowarecycles.org](http://iowarecycles.org))
- **A globe or picture of the earth**
- **Recycling bin/box to place mini-materials at the tipping end of the sort line**
- **A flat box to place under the driver rod of sort line to collect the fines**

## Key Vocabulary:

Recycle, renewable natural resource, non-renewable natural resource, bauxite, alum, iron ore, petroleum, conveyor, sort, bale, post consumer, and syringe.

## Lesson: Part 1-Natural Resources (30-50 minutes)

- **Read Aloud:** *Agatha's Feather Bed* by Carmen Deedy  
A CD with a Power Point presentation of *Agatha's Feather Bed* is provided for your use. As you turn the pages in the book advance the slide on the screen. You **MUST** use the presentation as you read the book. (In large groups this makes seeing the pictures easier for students.) The CD is not to be use as a "stand alone" program.
- **Present:** Natural Resources lesson: (labeled samples of resources with "factoids" are provided in kit)
  - Repeat the rhyme from *Agatha's Feather Bed*: "Everything comes from something...."
  - Show picture of earth or globe. Explain that "everything" comes from the earth.
  - Define renewable and non-renewable resources.
  - Using samples of recyclable materials (cans,bottles, paper) "pull" corresponding natural resource "out" of the earth. Discuss resources and commodities into which they are made: Iron ore-steel-can; Bauxite-alum-aluminum-can; Petroleum-plastic-milk jug; Trees-paper-box; Sand-glass-bottle. When these materials are recycled they are made into a "new" usable product. (Time permitting show examples of recycled content products ex. Pop bottle t-shirt)
  - Explain what can be recycled (locally) and how to prepare material for recycling.



## Mini-MRF Lesson continued

### Lesson: Part 2-The Mini-MRF (30-45 minutes)

A material recovery facility (or MRF) is a recycling center using a conveyor line to sort recovered materials for resale and remanufacturing. Student will be assigned a station and become a recycling "worker." They will use the information gained in Part 1 to sort materials into appropriate categories.

#### Assemble MRF using directions enclosed in kit:

- If you are presenting Part 1 and 2 in one class period, assemble MRF before class.
- Hang boxes on frame of MRF. Place OCC-cardboard box(es) at tipping end, Steel close to magnet, Aluminum down line from the steel. Plastic and paper sorts (white, news, magazines, mixed) should be interspersed along the line.

#### Work the MRF:

The MRF line has room for up to 14 stations, depending on age/size of students (a boss, a hauler and 12 sorters.) If class has more than 10-14 students then a "second" shift is rotated in while the "first" shift observes. (NOTE: Groups of 20-25 work well using two shifts)

- **Assign work stations:** Each worker should wear gloves provided in kit. (Discuss workplace safety)
  - Hauler uses red scoop to place material on the end of the line. (Hauler unloads his materials as quickly as possible without regard to speed of the line.)
  - Sorters are assigned stations by labeled boxes. Materials (white, mixed, and news paper, magazines, OCC-cardboard, plastic, steel cans, aluminum cans) are sorted from the line into the boxes. (NOTE: There is a glass box. For safety reasons there is no glass in the mini-materials.)
  - Boss uses socket driver to crank the line. (Discuss the speed/worker/waste ratio. The faster the line moves the harder the sorters work. If workers can't keep up, materials that could be recycled end up in the fines pile and are taken to the landfill. The boss pays for disposal.)
- **Run the line** (5-8 minutes each shift)
  - Sorters must STOP the line when a crayon (representing a syringe) is found. Once the safety hazard is removed, work may resume. (Remove crayon from line and put back in materials bin. Discuss worker safety/work conditions.)
  - Change shifts: send "workers" home by dismissing them to their seats.
- **Worker evaluation** (after discussion, place materials back in recycling bin at tipping end for next shift)
  - Go through boxes discussing the quality of materials sorted. (Is there contamination?)
  - Go through fines box to see materials missed by sorters. (Materials in fine box are taken to the landfill for disposal. This is an operating expense for the "boss." Materials that could have been recovered (recycled) found in the fine box is money lost for the "boss." How did the boss do?)
  - Rotate in new "sorters" until all workers have worked a shift.

**Each worker receives a "MRF it-to-MORF" sticker**

**NOTE:** To enhance, supplement, or extend this lesson a copy of "What is a MRF?" from the Waste in Place curriculum developed by Keep America Beautiful, Inc., 1997, has been included in the kit.